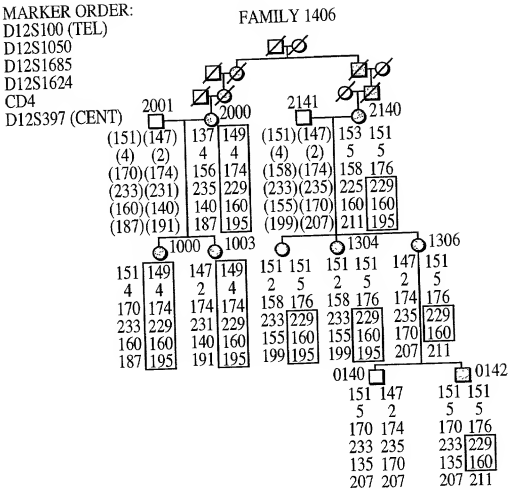


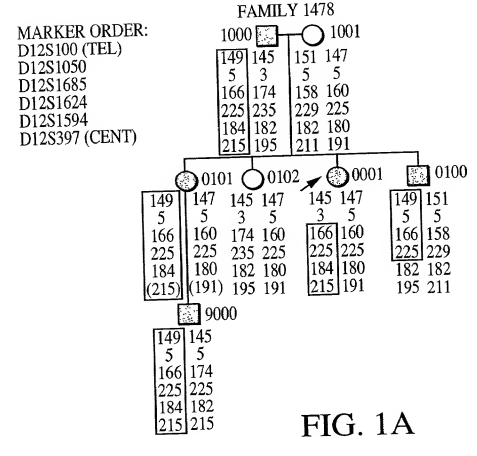


FIG. 1A

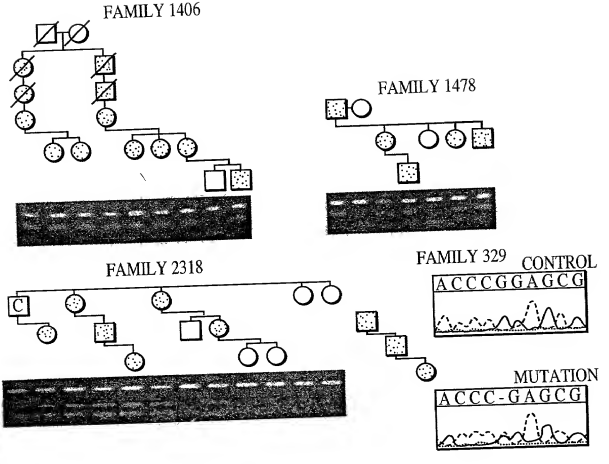
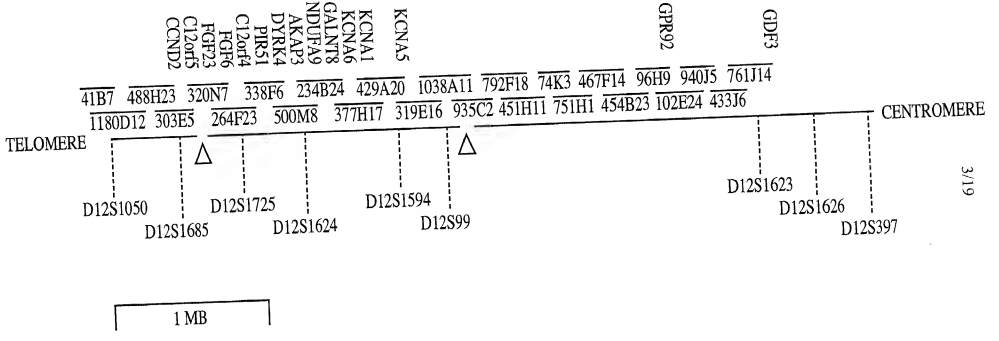

FAMILY 1406
FAMILY 1478
FAMILY 2318
FAMILY 329
CONTROL
ACCCGGAGCG
MUTATION
ACCC-GAGCG

FIG. 1B



3/19

FIG. 2

```
FGF12   LKG.IVT..RLFSQQG.....YFLQMHPDGTIDGTKDENSDYTLFNLIPVGLR.   114
FGF14   LKG.IVT..RLYCRQG.....YYLQMHPDGALDGTKDDSTNSTLFNLIPVGLR.   112
FGF13   LKG.IVT..KLYSRQG.....YHLQLQADGTIDGTKDEDSTYTLFNLIPVGLR.   110
FGF11   LKG.IVT..KLFCRQG.....FYLQANPDGSIQGTPEDTSSFTHFNLIPVGLR.   112
FGF16   LKG.ILRRRQLYCRTG.....FHLEIFPNGTVHGTRHDHSRFGILEFISLAVG.   102
FGF9    LKG.ILRRRQLYCRTG.....FHLEIFPNGTIQGTRKDHSRFGILEFISIAVG.   103
FGF10   LQG.DVRWRKLFSFTK.....YFLKIEKNGKVSGTKKENCPYSILEITSVEIG.   119
FGF7    MEGGDIRVRRLFCRTQ.....WYLRIDKRGKVKGTQEMKNNYNIMEIRTVAVG.   106
FGF3    LGGAPRR·RKLYCATK.....YHLQLHPSGRVNGSLENS.AYSILEITAVEVG.   84
FGF1    PPGNYKKPKLLYCSNG....GHFLRILPDGTVDGTRDRSDQHIQLQLSAESVG.   67
FGF2    PPGHFKDPKRLYCKNG....GFFLRIHPDGRVDGVREKSDPHIKLQLQAEERG.   125
FGF4    LLGIKRL.RRLYCNVGI...GFHLQALPDGRIGGAHADT.RDSLLELSPVERG.   124
FGF6    LVGIKRQ.RRLYCNVGI...GFHLQVLPDGRISGTHEEN.PYSLLEISTVERG.   126
FGF5    SPS.GRRTGSLYCRVG...IGFHLQIYPDGKVNGSHEAN.MLSVLEIFAVSQG.   129
FGF18   VSRKQLRLYQLYSRTS....GKHIQVLG.RRISARGEDGDKYAQLLVETDTFGS   95
FGF8    LSRRLIRTYQLYSRTS....GKHVQVLANKRINAMAEDGDPFAKLIVETDTFGS   95
FGF17   LSRRQIREYQLYSRTS....GKHVQVTG.RRISATAEDGNKFAKLIVETDTFGS   95
FGF15   GWGKITRLQYLYSAGPY.VSNCFLRIRSDGSVDCEEDQN.ERNLLEFRAVALK.   95
FGF19   GWGDPIRLRHLYTSGPHGLSSCFLRIRADGVVDCARGQS.AHSLLEIKAVALR.   88
FGF21   QFGGQVRQRYLYTDDAQQT.EAHLEIREDGTVGGAADQS.PESLLQLKALKPG.   89
FGF23   SWGG...LIHLYTATARN.S.YHLQIHKNGHVDGAPHQT.IYSALMIRSEDAG.   81
               ——1——            ——2——  ——3——       ——4——
```

FIG. 3A

```
FGF12   VVAIQGVKASLYVAMNGEGYLYSSDV.FTPECKFKESVFENYYVIYSSTLY...  164
FGF14   VVAIQGVKTGLYIAMNGEGYLYPSEL.FTPECKFKESVFENYYVIYSSMLY...  162
FGF13   VVAIQGVQTKLYLAMNSEGYLYTSEL.FTPECKFKESVFENYYVTYSSMIY...  160
FGF11   VVTIQSAKLGHYMAMNAEGLLYSSPH.FTAECRFKECVFENYYVLYASALY...  162
FGF16   LISIRGVDSGLYLGMNERGELYGSKK.LTRECVFREQFEENWYNTYASTLY...  152
FGF9    LVSIRGVDSGLYLGMNEKGELYGSEK.LTQECVFREQFEENWYNTYSSNLY...  153
FGF10   VVAVKAINSNYYLAMNKKGKLYGSKE.FNNDCKLKERIEENGYNTYASFNW...  169
FGF7    IVAIKGVESEFYLAMNKEGKLYAKKE.CNEDCNFKELILENHYNTYASAKW...  156
FGF3    IVAIRGLFSGRYLAMNKRGRLYASEH.YSAECEFVERIHELGYNTYASRLYRTV  137
FGF1    EVYIKSTETGQYLAMDTDGLLYGSQT.PNEECLFLERLEENHYNTYISKKH...  117
FGF2    VVSIKGVCANRYLAMKEDGRLLASKC.VTDECFFFERLESNNYNTYRSRKY...  175
FGF4    VVSIFGVASRFFVAMSSKGKLYGSPF.FTDECTFKEILLPNNYNAYESYKY...  174
FGF6    VVSLFGVRSALFVAMNSKGRLYATPS.FQEECKFRETLLPNNYNAYESDLY...  176
FGF5    IVGIRGVFSNKFLAMSKKGKLHASAK.FTDDCKFRERFQENSYNTYASAIHRTE  182
FGF18   QVRIKGKETEFYLCMNRKGKLVGKPDGTSKECVFIEKVLENNYTALMSAKY...  146
FGF8    RVRVRGAETGLYICMNKKGKLIAKSNGKGKDCVFTEIVLENNYTALQNAKY...  146
FGF17   RVRIKGAESEKYICMNKRGKLIGKPSGKSKDCVFTEIVLENNYTAFQNARH...  146
FGF15   TIAIKDVSSVRYLCMSADGKIYGLIRYSEEDCTFREEMDCLGYNQYRSMKH...  146
FGF19   TVAIKGVHSVRYLCMGADGKMQGLLQYSEEDCAFEEEIRPDGYNVYRSEKH...  139
FGF21   VIQILGVKTSRFLCQRPDGALYGSLHFDPEACSFRELLLEDGYNVYQSEAH...  140
FGF23   FVVITGVMSRRYLCMDFRGNIFGSHYFDPENCRFQHQTLENGYDVYHSPQYHFL  135
        ——5——   ——6——   —7—        ——8——    ——9——
```

FIG. 3B

```
FGF12   .......RQQESGRAWFLGLNKEGQIMKGN..RVKKTKPSSHFVPKPIEVCMY   208
FGF14   .......RQQESGRAWFLGLNKEGQAMKGN..RVKKTKPAAHFLPKPLEVAMY   206
FGF13   .......RQQQSGRGWYLGLNKEGEIMKGN..HVKKNKPAAHFLPKPLKVAMY   204
FGF11   .......RQRRSGRAWYLGLDKEGQVMKGN..RVKKTKAAAHFLPKLLEVAMY   206
FGF16   .......KHSDSERQYYVALNKDGSPREGY..RTKRHQKFTHFLPRPVDPSKL   196
FGF9    .......KHVDTGRRYYVALNKDGTPREGT..RTKRHQKFTHFLPRPVDPDKV   197
FGF10   .........QHNGRQMYVALNGKGAPRRGQ..KTRRKNTSAHFLPMVVHS~~~   208
FGF7    .........THNGGEMFVALNQKGIPVRGK..KTKKEQKTAHFLPMAIT~~~~   194
FGF3    SSTPGARRQPSAERLWYVSVNGKGRPRRGF..KTRRTQKSSLFLPRVLDHRDH   188
FGF1    ...........AEKNWFVGLKKNGSCKRGP..RTHYGQKAILFLPLPVSSD~~   155
FGF2    ............TSWYVALKRTGQYKLGS..KTGPGQKAILFLPMSAKS~~~   210
FGF4    ............PGMFIALSKNGKTKKGN..RVSPTMKVTHFLPRL~~~~~~   206
FGF6    ............QGTYIALSKYGRVKRGS..KVSPIMTVTHFLPRI~~~~~~   208
FGF5    KT..........GREWYVALNKRGKAKRGCSPRVKPQHISTHFLPRFKQSEQP   225
FGF18   ............SGWYVGFTKKGRPRKGP..KTRENQQDVHFMKRYPKGQP.   183
FGF8    ............EGWYMAFTRKGRPRKGS..KTRQHQREVHFMKRLPRGHHT   184
FGF17   ............EGWFMAFTRQGRPRQAS..RSRQNQREAHFIKRLYQGQLP   184
FGF15   ............HLHIIFIQAK.PREQL.....QDQKPSNFIPVFHRSFFE   179
FGF19   ............RLPVSLSSAK.QRQLY..KNRGFLPLSHFLPMLPMVPEE   175
FGF21   ............GLPLHLPGNKSPHRDP....APR.GPARFLPLPGLPPAL   174
FGF23   VSL.........GRAKRAFLPGMNPPPYSQFLSRRNEIPLIHFNTPIPRRHTR   179
                       —10—    —11—        ——12—    *  *
```

FIG. 3C

FIG. 4A

FIG. 4B

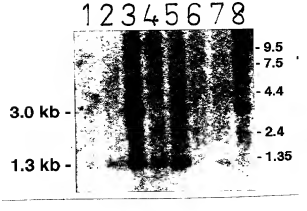


Figure 5A

CGGCAAAAAGGAGGGAATCCAGTCTAGGATCCTCACACCAGCTACTTGC
AAGGGAGAAGGAAAAGGCCAGTAAGGCCTGGGCCAGGAGAGTCCCGACA
GGAGTGTCAGGTTTCAATCTCAGCACCAGCCACTCAGAGCAGGGCACGA
TGTTGGGGGCCCGCCTCAGGCTCTGGGTCTGTGCCTTGTGCAGCGTCTG
CAGCATGAGCGTCCTCAGAGCCTATCCCAATGCCTCCCCACTGCTCGGC
TCCAGCTGGGGTGGCCTGATCCACCTGTACACAGCCACAGCCAGGAACA
GCTACCACCTGCAGATCCACAAGAATGGCCATGTGGATGGCGCACCCCA
TCAGACCATCTACAGTGCCCTGATGATCAGATCAGAGGATGCTGGCTTT
GTGGTGATTACAGGTGTGATGAGCAGAAGATACCTCTGCATGGATTTCA
GAGGCAACATTTTTGGATCACACTATTTCGACCCGGAGAACTGCAGGTT
CCAACACCAGACGCTGGAAAACGGGTACGACGTCTACCACTCTCCTCAG
TATCACTTCCTGGTCAGTCTGGGCCGGGCGAAGAGAGCCTTCCTGCCAG
GCATGAACCCACCCCCGTACTCCCAGTTCCTGTCCCGGAGGAACGAGAT
CCCCCTAATTCACTTCAACACCCCCATACCACGGCGGCACACCCGGAGC
GCCGAGGACGACTCGGAGCGGGACCCCCTGAACGTGCTGAAGCCCCGGG
CCCGGATGACCCCGGCCCCGGCCTCCTGTTCACAGGAGCTCCCGAGCGC
CGAGGACAACAGCCCGATGGCCAGTGACCCATTAGGGGTGGTCAGGGGC
GGTCGAGTGAACACGCACGCTGGGGGAACGGGCCCGGAAGGCTGCCGCC
CCTTCGCCAAGTTCATCTAGGGTCGCTGGAAGGGCACCCTCTTTAACCC
ATCCCTCAGCAAACGCAGCTCTTCCCAAGGACCAGGTCCCTTGACGTTC
CGAGGATGGGAAAGGTGACAGGGGCATGTATGGAATTTGCTGCTTCTCT
GGGGTCCCTTCCACAGGAGGTCCTGTGAGAACCAACCTTTGAGGCCCAA
GTCATGGGGTTTCACCGCCTTCCTCACTCCATATAGAACACCTTTCCCA
ATAGGAAACCCCAACAGGTAAACTAGAAATTTCCCCTTCATGAAGGTAG
AGAGAAGGGGTCTCTCCCAACATATTTCTCTTCCTTGTGCCTCTCCTCT
TTATCACTTTTAAGCATAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
GCAGTGGGTTCCTGAGCTCAAGACTTTGAAGGTGTAGGGAAGAGGAAAT
CGGAGATCCCAGAAGCTTCTCCACTGCCCTATGCATTTATGTTAGATGC
CCCGATCCCACTGGCATTTGAGTGTGCAAACCTTGACATTAACAGCTGA
ATGGGGCAAGTTGATGAAAACACTACTTTCAAGCCTTCGTTCTTCCTTG
AGCATCTCTGGGGAAGAGCTGTCAAAAGACTGGTGGTAGGCTGGTGAAA
ACTTGACAGCTAGACTTGATGCTTGCTGAAATGAGGCAGGAATCATAAT
AGAAAACTCAGCCTCCCTACAGGGTGAGCACCTTCTGTCTCGCT

Figure 5B

MLGARLRLWVCALCSVCSMSVLRAYPNASPLLGSSWGGLIHLYTATARN
SYHLQIHKNGHVDGAPHQTIYSALMIRSEDAGFVVITGVMSRRYLCMDF
RGNIFGSHYFDPENCRFQHQTLENGYDVYHSPQYHFLVSLGRAKRAFLP
GMNPPPYSQFLSRRNEIPLIHFNTPIPRRHTRSAEDDSERDPLNVLKPR
ARMTPAPASCSQELPSAEDNSPMASDPLGVVRGGRVNTHAGGTGPEGCR
PFAKFI

Figure 6A

AGCCTGTCTGGGAGTGTCAGATTTCAAACTCAGCATTAGCCACTCAGTG
CTGTGCAATGCTAGGGACCTGCCTTAGACTCCTGGTGGGCGTGCTCTGC
ACTGTCTGCAGCTTGGGCACTGCTAGAGCCTATCCGGACACTTCCCCAT
TGCTTGGCTCCAACTGGGGAAGCCTGACCCACCTGTACACGGCTACAGC
CAGGACCAGCTATCACCTACAGATCCATAGGGATGGTCATGTAGATGGC
ACCCCCCATCAGACCATCTACAGTGCCCTGATGATTACATCAGAGGACG
CCGGCTCTGTGGTGATAACAGGAGCCATGACTCGAAGGTTCCTTTGTAT
GGATCTCCACGGCAACATTTTTGGATCGCTTCACTTCAGCCCAGAGAAT
TGCAAGTTCCGCCAGTGGACGCTGGAGAATGGCTATGACGTCTACTTGT
CGCAGAAGCATCACTACCTGGTGAGCCTGGGCCGCGCCAAGCGCATCTT
CCAGCCGGGCACCAACCCGCCGCCCTTCTCCCAGTTCCTGGCTCGCAGG
AACGAGGTCCCGCTGCTGCATTTCTACACTGTTCGCCCACGGCGCCACA
CGCGCAGCGCCGAGGACCCACCGGAGCGCGACCCACTGAACGTGCTCAA
GCCGCGGCCCCGCGCCACGCCTGTGCCTGTATCCTGCTCTCGCGAGCTG
CCGAGCGCAGAGGAAGGTGGCCCCGCAGCCAGCGATCCTCTGGGGGTGC
TGCGCAGAGGCCGTGGAGATGCTCGCGGGGGCGCGGAGGCGCGGATAG
GTGTCGCCCCTTTCCCAGGTTCGTCTAGGTCCCCAGGCCAGGCTGCGTC
CGCCTCCATCCTCCAGTCGGTTCAGCCCACGTAGAGGAAGGACTAGGGT
ACCTCGAGGATGTCTGCTTCTCTCCCTTCCCTATGGGCCTGAGAGTCAC
CTGCGAGGTTCCAGCCAGGCACCGCTATTCAGAATTAAGAGCCAACGGT
GGGAGGCTGGAGAGGTGGCGCAGACAGTTCTCAGCACCCACAAATACCT
GTAATTCTAGCTCCAGGGGAATCTGTACTCACACACACACACATCCACA
CACACACACACACACATACATGTAATTTTAAATGTTAATCTGATTTAAA
GACCCCAACAGGTAAACTAGACACGAAGCTCTTTTTATTTTATTTTACT
AACAGGTAAACCAGACACTTGGCCTTTATTAGCCGGGTCTCTTGCCTAG
CATTTTAATCGATCAGTTAGCACGAGGAAAGAGTTCACGCCTTGAACAC
AGGGAAGAGGCCATCTCTGCAGCTTCTAGTTACTATTCTGGGATTCACG
GGTGTTTGAGTTTGAGCACCTTGACCTTAATGTCTTCACTAGGCAAGTC
GAAGAAAGACGCGCATTTCTTCTCTTTGGGAAGAGCTTTGGATTGGCGG
GAGGCTGACAAGGACACCTAAACCGAACACATTTCAGAGTTCAGCCTCC
CTGAGGAATGATTCGCCAATGATTCTGTGATAGGACCAGTCAGTAGCTT
TTGAATTTGCCCTGGCTCAGCAAAGTCTACCTTGCTAGGG

Figure 6B

MLGTCLRLLVGVLCTVCSLGTARAYPDTSPLLGSNWGSLTHLYTATART
SYHLQIHRDGHVDGTPHQTIYSALMITSEDAGSVVITGAMTRRFLCMDL
HGNIFGSLHFSPENCKFRQWTLENGYDVYLSQKHHYLVSLGRAKRIFQP
GTNPPPFSQFLARRNEVPLLHFYTVRPRRHTRSAEDPPERDPLNVLKPR
PRATPVPVSCSRELPSAEEGGPAASDPLGVLRRGRGDARGGAGGADRCR
PFPRFV

FIG. 7A

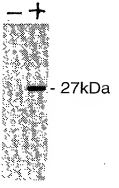


FIG. 7B

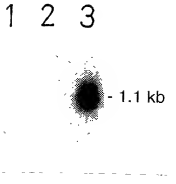


FIG. 7C

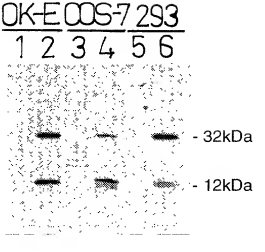


FIG.8A

1 2 3 4 5 6 7 8 9 10

FIG.8B

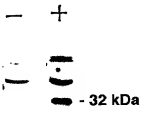


Figure 9

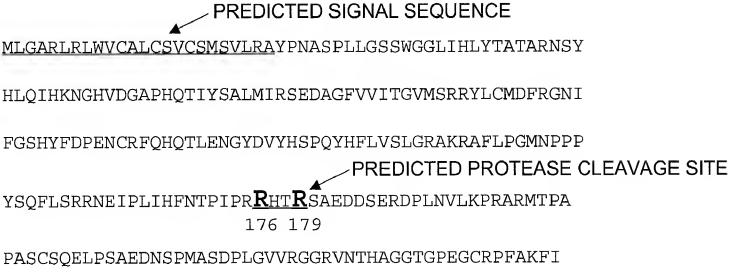


FIG. 10A

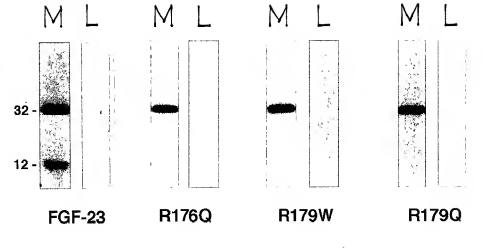


Figure 10B

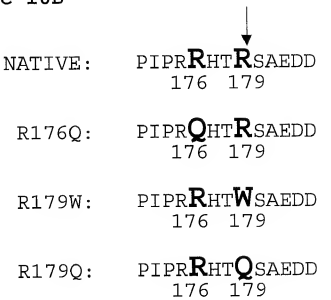


FIG.11A

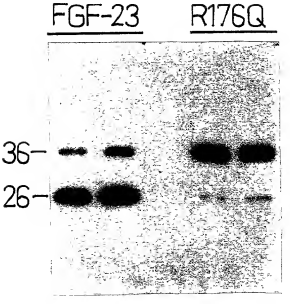


FIG. 11B

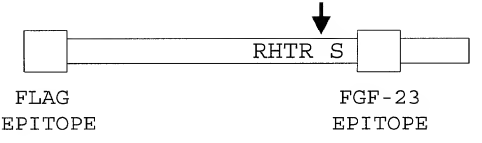


FIG. 12A

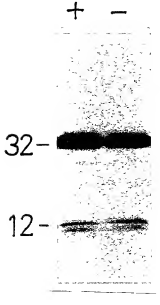


FIG. 12B

FIG. 13